NASA STTR 2014 Phase I Solicitation

T6.01 Synthetic/Engineering Biology for NASA Applications

Lead Center: ARC

Participating Center(s): JSC, KSC, MSFC

Synthetic Biology (SB) provides a unique opportunity to engineer organisms that reliably perform necessary functions for future exploration activities. NASA is interested in harnessing this emerging field to create technological advances that will benefit both spaceflight and future surface missions in a variety of enabling areas. Proposals must use a biologically-based approach, such as synthetic biology, to engineer novel biologically-based (or inspired) functions that do not exist in nature. Proposed projects may include creating new capability by designing microorganisms, plants, and/or cell-free systems for air revitalization, water recovery, in situ resource utilization, and/or the production of novel chemicals and biomolecules of benefit to space exploration. Applications may include (but are not limited to) more reliable and efficient life support systems; the acquisition and utilization of in situ resources; and the production of consumables such as feedstock for advanced manufacturing or food. Proposals should address how systems and technologies will reduce the required up-mass and dependence on consumables, resupply, and energy.

Of additional interest is the miniaturization and automation of critical technologies required to monitor and implement synthetic biology beyond low Earth orbit.

All proposals should consider the novel environment in which these systems will eventually be deployed – this includes altered gravity, temperature extremes, high radiation, etc.